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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,943	10/17/2003	Sivakumar Muthuswamy	CM01523LD01	9908

24273 7590 10/13/2005

MOTOROLA, INC  
INTELLECTUAL PROPERTY SECTION  
LAW DEPT  
8000 WEST SUNRISE BLVD  
FT LAUDERDAL, FL 33322

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 10/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/687,943

Applicant(s)

MUTHUSWAMY ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office action addresses claims 1-19. Applicant's statement of common ownership is sufficient to obviate the 103 rejection over the Kim et al. reference and claims 2-8 now contain allowable subject matter. However, the declarations under 37 CFR 1.132 are not persuasive for the reasons set forth below. As such, claims 1 and 9-19 remain rejected for substantially the reasons of record. Additionally, a new ground of rejection under the doctrine of obviousness-type double patenting has been applied to claims 1-17. As such, this action is non-final.

### ***Claim Suggestions***

2. Claims 8 and 17 recite "a current collector interposed between the porous gas diffusion layer disposed on the first surface and the second opposing surface of the membrane electrode assembly." It appears that this language is reciting that the current collector is positioned between the first surface of the MEA and the gas diffusion layer as shown in Figure 3. Amendment of the claim to reflect this is suggested but not required.

### ***Claim Rejections - 35 USC § 102***

3. Claims 1, 9, 10, 18, and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al (U.S. Patent 6,699,611). The reference is directed to a fuel cell comprising a

membrane electrode assembly (MEA). A gas-diffusion layer of thermo-responsive polymer is disposed proximate to the MEA, i.e., on a first surface thereof (see col. 4, line 19 et seq). The thermo-responsive polymer may either increase or decrease in porosity in response to an increase or decrease in temperature (see Fig. 4). Thus, the instant claims are anticipated.

4. Claims 10-12, 18, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 6-267555. The reference is directed to a fuel cell comprising an MEA consisting of an electrolyte membrane and electrocatalysts (see abstract, paragraph 53 of the machine translation). Electrically conductive gas-diffusion layers (12, 13) are disposed on the MEA (see abstract). The gas diffusion layers comprise metal fibers (see paragraph 26), which are inherently PTCE materials. The gas diffusion layers are interposed between the MEA and current collectors (see paragraph 76). Since the metal fiber is a PTCE material, the metal fiber layer would inherently be responsive to the temperature of the MEA. Accordingly, the porosity of the metal fiber layer would decrease with increasing temperature, thereby selectively limiting the amount of reactants reaching localized areas of the MEA.

Thus, the instant claims are anticipated.

***Claim Rejections - 35 USC § 103***

5. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 6-267555 in view of Fredley (U.S. Patent 5,998,058).

JP '555 is applied to claims 10-12, 18, and 19 for the reasons stated above. Regarding claim 15, the metal fibers may comprise a core layer, which core layer may be further coated with metal (see abstract).

JP '555 does not expressly teach that the gas diffusion layer is microporous, as recited in claims 13 and 15.

Fredley is directed to polymer electrolyte fuel cells having electrode support diffusion layers (40, 42) (see Figure 2). In column 6, lines 9-16, the reference teaches that the support layers are made of carbon fiber and have mean pore diameters of about 10-60 microns.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Fredley would motivate the artisan to use a mean pore size of 10-60 microns in the diffusion layers of JP '555, thereby rendering the diffusion layers "microporous." In column 6, line 9, Fredley discloses that the "manufacture of an improved porous support layer 40, 42 of the present invention includes treating a carbon fiber substrate having mean pore diameters and total pore volume appropriate for efficient transfer of fluids in an electrochemical cell such as the described fuel cell 10." Since Fredley identifies pore diameters of 10-60 microns as being suitable, the artisan would be motivated to use this pore size in the diffusion layers of JP '555, thereby rendering the diffusion layers "microporous."

***Double Patenting***

6. Claims 1-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,743,543. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '543 patent anticipate the instant claims. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993).

7. Claims 1-17 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 6,699,611. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '611 patent anticipate instant claims 1, 9, 10, 18, and 19. Further, instant claims 2-8 and 11-17 define obvious variants of the '611 patent claims because providing means for making a gas diffusion layer electrically conductive would be obvious to a person of ordinary skill in the art.

***Response to Arguments/Declaration***

8. Applicant's arguments filed August 8, 2005 have been fully considered but they are not persuasive.

With regard to the JP '555 reference, Applicants assert that this reference "describes and claims a 'solid high polymer electrolyte' only" as opposed to an assembly of different layers of

materials. However, the reference teaches electrocatalysts, corresponding to the claimed “anode” and “cathode” as well as the diffusion layers corresponding to the claimed “variable porosity gas diffusion material.” Accordingly, it is believed that the claims are properly anticipated by the JP ‘555 reference.

Regarding the declarations filed under 37 CFR 1.132, these declarations are also not persuasive in overcoming the 102 rejection over the Kim reference. Each declaration states that Mr. Pratt and Mr. Kelley conceived of the subject matter relied upon in the Kim reference in rejecting the claims of the present application (i.e., claims 1, 9, 10, 18, and 19). Each declaration also states that Mr. Pratt, Mr. Kelley, and Mr. Muthuswamy conceived of the subject matter claimed *in all the claims* of the instant application. These two statements are in conflict with each other because the first statement implies that Mr. Pratt and Mr. Kelley conceived of the subject matter of claims 1, 9, 10, 18, and 19, while the second statement implies that Mr. Pratt, Mr. Kelley, and Mr. Muthuswamy conceived of the subject matter of claims 1, 9, 10, 18, and 19 (among other claims). Thus, it is still not clear who conceived of the subject matter of claims 1, 9, 10, 18, and 19. As such, the rejection under 35 USC 102 is maintained.

Regarding the obviousness-type double patenting rejection over the ‘543 patent, Applicants state that a Terminal Disclaimer was filed with the present response, but this document was not found in the file. As such, the rejection is maintained. As a further note, Applicants are advised that the submission of a single Terminal Disclaimer identifying both the ‘543 patent and the newly applied ‘611 patent would be sufficient to obviate the double patenting rejections.

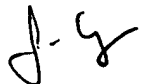
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***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1746  
October 7, 2005